NEURAL NETWORKS

Contents/Author Index
Volume 7, 1994

Pergamon

NEURAL NETWORKS

The Official Journal of the International Neural Network Society, European Neural Network Society, and Japanese Neural Network Society

CO-EDITORS-IN-CHIEF

STEPHEN GROSSBERG
Boston University
Department of Cognitive and
Neural Systems
111 Cummington Street
Boston, MA 02215
USA

MITSUO KAWATO
ATR Human Information Processing
Research Laboratories
2-2 Hikaridai, Seika-cho
Soraku-gun, Kyoto 619-02
Japan

JOHN TAYLOR
King's College London
Department of Mathematics
University of London
Strand, London WC2R 2LS
England

SPECIALTY EDITORS

Current Events
Paul Bakker

Book Reviews
Rolf Eckmiller
Daniel Levine

Patents
Donald Wenskay

(see the Instructions to Authors for complete addresses)

EDITORIAL BOARD

Kazuyuki Aihara, *Tokyo*
Igor Aleksander, *London*
Luis B. Almeida, *Lisbon*
Dana Anderson, *Boulder*
Yuichiro Anzai, *Yokohama*
Hideki Asoh, *Tsukuba*
Agnesse Babloyantz, *Brussels*
Pierre Baldi, *Pasadena*
Jacob Barhen, *Pasadena*
Andrew Barron, *New Haven*
Andrew Barto, *Amherst*
Eric Baum, *Princeton*
Elie Bienenstock, *Providence*
Roman Borisyuk, *Moscow*
Daniel Bullock, *Boston*
Terry Caelli, *Perth*
Gail Carpenter, *Boston*
David Casasent, *Pittsburgh*
Thomas P. Caudell, *Albuquerque*
Michael A. Cohen, *Boston*
Leon Cooper, *Providence*
Rodney M. J. Cotterill, *Lyngby*
Jack Cowan, *Chicago*
George Cybenko, *Hanover*
Max Cynader, *Vancouver*
John Daugman, *Cambridge*
Kenji Doya, *San Diego*
Rolf Eckmiller, *Bonn*
Jeffrey Elman, *La Jolla*
Bard Ermentrout, *Pittsburgh*
Nabil Farhat, *Philadelphia*
Françoise Fogelman, *Clamart*
Walter Freeman, *Berkeley*
Kunihiko Fukushima, *Osaka*
Stan Gielen, *Nijmegen*
Lee Giles, *Princeton*
Guenter Gross, *Denton*
Stephen J. Hanson, *Princeton*
Robert Hecht–Nielsen, *San Diego*
Uwe an der Heiden, *Witten–Annen*
Okihide Hikosaka, *Tokyo*
Yuzo Hirai, *Tsukuba*
Toshio Inui, *Kyoto*
Masumi Ishikawa, *Fukuoka*
Michael Jordan, *Cambridge*
Hidenori Kawahara, *Kyoto*
Scott Kelso, *Boca Raton*
Christof Koch, *Pasadena*
Nancy Kopell, *Boston*
Bart Kosko, *Los Angeles*
Michael Kuperstein, *Wellesley*
Kouji Kurata, *Osaka*
Kazuo Kyuma, *Amagasaki*
Daniel Levine, *Arlington*
Richard Lippmann, *Lexington*
Gary Lynch, *Irvine*
Hanspeter Mallot, *Tübingen*
Christoph von der Malsburg, *Bochum*
Kazuhiro Matsuo, *Chiba*
Ennio Mingolla, *Boston*
Sei Miyake, *Tokyo*
Yasushi Miyashita, *Tokyo*
Paul Mueller, *Philadelphia*
Masao Mukaidono, *Kawasaki*
David Mumford, *Cambridge*
Mirko Novak, *Prague*
Erkki Oja, *Lappeenranta*
Lance Optican, *Bethesda*
Günther Palm, *Ulm*
Andras Pellionisz, *Moffett Field*
Fernando Pineda, *Laurel*
V. S. Ramachandran, *La Jolla*
Adam Reeves, *Boston*
Eric Schwartz, *Boston*
Werner von Seelen, *Bochum*
Terrence Sejnowski, *San Diego*
Allen Selverston, *La Jolla*
Robert Shapley, *New York*
Shigeru Shinomoto, *Kyoto*
Wolf Singer, *Frankfurt*
Bernard Soffer, *Malibu*
Eduardo Sontag, *New Brunswick*
Hector Sussmann, *New Brunswick*
Ryoji Suzuki, *Tokyo*
Harold Szu, *Silver Spring*
Keiji Tanaka, *Wako*
James Todd, *Columbus*
Ichiro Tsuda, *Sapporo*
Yoshinori Uesaka, *Tokyo*
Yoji Uno, *Kyoto*
Shiro Usui, *Toyohashi*
Les Valiant, *Cambridge*
Brian Wandell, *Palo Alto*
Allen Waxman, *Lexington*
Halbert White, *La Jolla*
Bernard Widrow, *Palo Alto*
Lei Xu, *Hong Kong*
Steven Zucker, *Montreal*

Production Editor: Nancy L. Ott, E-mail: N.OTT@ELSEVIER.COM

Editorial Offices: Stephen Grossberg, Department of Cognitive and Neural Systems, 111 Cummington Street, Boston University, Boston, MA 02215, USA; Mitsuo Kawato, ATR Human Information Processing Research Laboratories, 2-2 Hikaridai, Seika-cho, Soraku-gun, Kyoto 619-02, Japan; and John Taylor, King's College London, Department of Mathematics, University of London, Strand, London WC2R 2LS, England.

Publishing, Subscription, and Advertising Offices: Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, USA, E-mail Address: ESUK.USA@ELSEVIER.COM and Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, England.

Published Nine per Annum. *Annual Institutional Subscription Rate* (1995): North, Central, and South America, US$596.00. Rest of World £400.00. Associated Personal Subscription Rates are available on request for those whose institutions are library subscribers. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice. Members of the International Neural Network Society, European Neural Network Society, and Japanese Neural Network Society receive the journal as a benefit of membership (details can be found in this issue). Sterling prices are definitive. US dollar prices are quoted for convenience only, and are subject to exchange rate fluctuation.

Pergamon

Neural Networks, Vol. 7, No. 9, pp. III–XV, 1994
Copyright © 1994 Elsevier Science Ltd
Printed in the USA. All rights reserved
0893-6080/94 $6.00 + .00

Contents
Volume 7, 1994

NEURAL NETWORKS

Volume 7, Number 1 1994

CONTENTS

	v	**Editorial**
	vii	**Neural Networks Referees in 1993**
		Invited Article
P. Patrick van der Smagt	1	Minimisation Methods for Training Feedforward Neural Networks
		Contributed Articles
		Neuroscience and Neuropsychology
Michael E. Hasselmo	13	Runaway Synaptic Modification in Models of Cortex: Implications for Alzheimer's Disease
Kunihiko Fukushima Masato Okada Kazuhito Hiroshige	41	Neocognitron With Dual C-Cell Layers
Yoko Yamaguchi Hiroshi Shimizu	49	Pattern Recognition With Figure-Ground Separation by Generation of Coherent Oscillations
David Hestenes	65	Invariant Body Kinematics: I. Saccadic and Compensatory Eye Movements
David Hestenes	79	Invariant Body Kinematics: II. Reaching and Neurogeometry
		Mathematical and Computational Analysis
Tarek M. Nabhan Albert Y. Zomaya	89	Toward Generating Neural Network Structures for Function Approximation
Michael Lemmon	101	Topologically Ordered Competitive Sampling
Juha Karhunen Jyrki Joutsensalo	113	Representation and Separation of Signals Using Nonlinear PCA Type Learning
Eric B. Bartlett	129	Dynamic Node Architecture Learning: An Information Theoretic Approach
J. M. DeLaurentis F. M. Dickey	141	A Convexity-Based Analysis of Neural Networks
Daniel F. McCaffrey A. Ronald Gallant	147	Convergence Rates for Single Hidden Layer Feedforward Networks
Gail A. Carpenter	159	A Distributed Outstar Network for Spatial Pattern Learning
Pierre Courrieu	169	Three Algorithms for Estimating the Domain of Validity of Feedforward Neural Networks

Engineering and Design

Christian Cachin 175 Pedagogical Pattern Selection Strategies

Technology and Applications

Françoise Beaufays, Youssef Abdel-Magid, Bernard Widrow 183 Application of Neural Networks to Load-Frequency Control in Power Systems

Anna Esposito, Salvatore Rampone, Roberto Tagliaferri 195 A Neural Network for Error Correcting Decoding of Binary Linear Codes

Letters to the Editor

Qing Hu, David B. Hertz 203 An Inappropriate Use of Neural Networks for Forecasting

K. Chakraborty, K. Mehrotra, C. Mohan, S. Ranka 202 Response to Letter by Q. Hu and D. B. Hertz

Stephen Grossberg 205 Recognition and Segmentation of Connected Characters With Selective Attention

Kunihiko Fukushima 206 Response to Letter by S. Grossberg

Book Reviews

M. T. Manry 209 *Neural Networks: Algorithms, Applications, and Programming Techniques* by James A. Freeman and David M. Skapura

Paolo Gaudiano 213 *Motivation, Emotion, and Goal Direction in Neural Networks* Edited by Daniel S. Levine and Samuel J. Leven

215 **Current Events**

I INNS/ENNS/JNNS Membership Renewal Form

II New Instructions to Authors

V Editorial Board Addresses and Specialties

Volume 7, Number 2 1994

CONTENTS

Maria Marinaro xiii ***In Memoriam***

Contributed Articles

Neuroscience and Neuropsychology

Yukio Hayashi 219 Oscillatory Neural Network and Learning of Continuously Transformed Patterns

Mathematical and Computational Analysis

J. Chover 233 Recall Via Transient Neuronal Firing

Kaining Wang, Anthony N. Michel 251 Robustness and Perturbation Analysis of a Class of Artificial Neural Networks

Stefan Wimbauer **Nikolaus Klemmer** **J. Leo van Hemmen**	**261**	Universality of Unlearning
Elias B. Kosmatopoulos **Manolis A. Christodoulou**	**271**	The Boltzmann g-RHONN: A Learning Machine for Estimating Unknown Probability Distributions
Gerald Fahner **Rolf Eckmiller**	**279**	Structural Adaptation of Parsimonious Higher-Order Neural Classifiers
Zhenni Wang **Christine Di Massimo** **Ming T. Tham** **A. Julian Morris**	**291**	A Procedure for Determining the Topology of Multilayer Feedforward Neural Networks
Zaiyong Tang **Gary J. Koehler**	**301**	Deterministic Global Optimal FNN Training Algorithms
Danny S. Thomas **Amar Mitiche**	**313**	Asymptotic Optimality of Pattern Recognition by Regression Analysis
Bagrat Amirikian **Hajime Nishimura**	**321**	What Size Network Is Good for Generalization of a Specific Task of Interest?
		Engineering and Design
L. Deng **K. Hassanein** **M. Elmasry**	**331**	Analysis of the Correlation Structure for a Neural Predictive Model With Application to Speech Recognition
Robert Smalz **Michael Conrad**	**341**	Combining Evolution With Credit Apportionment: A New Learning Algorithm for Neural Nets
Sushmita Mitra **Sankar K. Pal**	**353**	Logical Operation Based Fuzzy MLP for Classification and Rule Generation
Apostolos Nicholas Refenes **Achileas Zapranis** **Gavin Francis**	**375**	Stock Performance Modeling Using Neural Networks: A Comparative Study With Regression Models
		Technology and Applications
Jun Takeuchi **Yukio Kosugi**	**389**	Neural Network Representation of Finite Element Method
S. Cavalieri **A. Di Stefano** **O. Mirabella**	**397**	Optimal Path Determination in a Graph by Hopfield Neural Network
		Letters to the Editor
Paolo Gaudiano **Dimitrij Surmeli** **Frank D. M. Wilson**	**405**	Gated Dipoles for Operant Conditioning
Jennifer L. Raymond **Douglas A. Baxter** **Dean V. Buonomano** **John H. Byrne**	**406**	Response to Letter by P. Gaudiano et al.
Mohammad Bahrami	**409**	Adapted Control of Dynamic Systems by Back Propagation Network
W. H. Schiffmann	**409**	Response to Letter by M. Bahrami

Qi Jia **Katsuyuki Hagiwara** **Naohiro Toda** **Shiro Usui**	**411**	Equivalence Relation Between the Back Propagation Learning Process of an FNN and That of an FNNG
	413	**Current Events**
	I	INNS/ENNS/JNNS Membership Renewal Form

Volume 7, Number 3 1994

CONTENTS

Contributed Articles

Neuroscience and Neuropsychology

Masakazu Matsugu **Alan L. Yuille**	**419**	Spatiotemporal Information Storage in a Content Addressable Memory Using Realistic Neurons

Mathematical and Computational Analysis

Nur Arad **Eric L. Schwartz** **Zvi Wollberg** **Yehezkel Yeshurun**	**441**	Acoustic Binaural Correspondence Used for Localization of Natural Acoustic Signals
Morris W. Hirsch	**449**	Saturation at High Gain in Discrete Time Recurrent Networks
Hidefumi Katsuura **David A. Sprecher**	**455**	Computational Aspects of Kolmogorov's Superposition Theorem
Robert L. Coultrip **Richard H. Granger**	**463**	Sparse Random Networks With LTP Learning Rules Approximate Bayes Classifiers via Parzen's Method
J. J. Kosowsky **A. L. Yuille**	**477**	The Invisible Hand Algorithm: Solving the Assignment Problem With Statistical Physics
Kevin S. Van Horn **Tony R. Martinez**	**491**	The Minimum Feature Set Problem
Michael Georgiopoulos **Juxin Huang** **Gregory L. Heileman**	**495**	Properties of Learning in ARTMAP

Engineering and Design

Thomas Martinetz **Klaus Schulten**	**507**	Topology Representing Networks
Y. Guan **T. G. Clarkson** **J. G. Taylor** **D. Gorse**	**523**	Noisy Reinforcement Training for pRAM Nets
Fu Lai Chung **Tong Lee**	**539**	Fuzzy Competitive Learning

Technology and Applications

Jun Tani **Naohiro Fukumura**	**553**	Learning Goal-Directed Sensory-Based Navigation of a Mobile Robot
Leonid I. Perlovsky	**565**	A Model-Based Neural Network for Transient Signal Processing

Letter to the Editor

Daniel C. Chin **573** A More Efficient Global Optimization Algorithm Based on Styblinski and Tang

Book Review

Peter H. Greene **575** *Subsymbolic Natural Language Processing: An Integrated Model of Scripts, Lexicon, and Memory* by Risto Miikkulainen

Call for Papers

579 1995 Special Issue: Neural Networks for Automatic Target Recognition

581 ***Current Events***

I INNS/ENNS/JNNS Membership Renewal Form

Volume 7, Number 4 1994

CONTENTS

Contributed Articles

Neuroscience and Neuropsychology

Jean-François Vibert
Khachayar Pakdaman
Noureddine Azmy **589** Interneural Delay Modification Synchronizes Biologically Plausible Neural Networks

Mathematical and Computational Analysis

Lei Xu
Adam Krzyżak
Alan Yuille **609** On Radial Basis Function Nets and Kernel Regression: Statistical Consistency, Convergence Rates, and Receptive Field Size

Jun Wang **629** A Deterministic Annealing Neural Network for Convex Programming

Engineering and Design

Sukhan Lee
Rhee M. Kil **643** Redundant Arm Kinematic Control With Recurrent Loop

Vicken Kasparian
Celal Batur
H. Zhang
J. Padovan **661** Davidon Least Squares-Based Learning Algorithm for Feedforward Neural Networks

Technology and Applications

Leonid I. Perlovsky
John Jaskolski **671** Maximum Likelihood Adaptive Neural Controller

Laura I. Burke **681** Neural Methods for the Traveling Salesman Problem: Insights From Operations Research

Roberto Battiti
Anna Maria Colla **691** Democracy in Neural Nets: Voting Schemes for Classification

Charles M. Bachmann
Scott A. Musman
Dong Luong
Abraham Schultz **709** Unsupervised BCM Projection Pursuit Algorithms for Classification of Simulated Radar Presentations

Call for Papers

729 1995 Special Issue: Neural Networks for Automatic Target Recognition

731 ***Current Events***

I INNS/ENNS/JNNS Membership Renewal Form

Volume 7, Number 5 1994

CONTENTS

Invited Article

Kumpati S. Narendra, Snehasis Mukhopadhyay 737 Adaptive Control of Nonlinear Multivariable Systems Using Neural Networks

Contributed Articles

Mathematical and Computational Analysis

Kiyotoshi Matsuoka, Mitsuru Kawamoto 753 A Neural Network That Self-Organizes to Perform Three Operations Related to Principal Component Analysis

Luis Gonzalez Sotelino, Marco Saerens, Hugues Bersini 767 Classification of Temporal Trajectories by Continuous-Time Recurrent Nets

Galina Rogova 777 Combining the Results of Several Neural Network Classifiers

Ali A. Minai, Ronald D. Williams 783 Perturbation Response in Feedforward Networks

Keihiro Ochiai, Naohiro Toda, Shiro Usui 797 Kick-Out Learning Algorithm to Reduce the Oscillation of Weights Engineering and Design

Engineering and Design

Brian A. Telfer, Harold H. Szu 809 Energy Functions for Minimizing Misclassification Error With Minimum-Complexity Networks

Johan A. K. Suykens, Bart L. R. De Moor, Joos Vandewalle 819 Static and Dynamic Stabilizing Neural Controllers, Applicable to Transition Between Equilibrium Points Technology and Applications

Technology and Applications

K. P. Venugopal, A. S. Pandya, R. Sudhakar 833 A Recurrent Neural Network Controller and Learning Algorithm for the On-Line Learning Control of Autonomous Underwater Vehicles

Letters to the Editor

E. V. Krishnamurthy 847 Unsolvability, Complexity, and Neural Networks

Kevin T. Judd, Kazuyuki Aihara 848 Response to Letter by E. V. Krishnamurthy

Book Reviews

John Fiala, Frank H. Guenther 851 *Handbook of Intelligent Control: Neural, Fuzzy, and Adaptive Approaches* by D. A. White and D. A. Sofge

William R. Softky	**853**	*Theoretical Mechanics of Biological Neural Networks* by Ronald MacGregor
	857	***Current Events***
	I	INNS/ENNS/JNNS Membership Renewal Form

Volume 7, Numbers 6/7 1994

CONTENTS

1994 Special Issue: Models of Neurodynamics and Behavior

		Introduction
Stephen Grossberg **John G. Taylor**	**863**	Introduction: 1994 Special Issue
		1994 Special Issue Articles
Gary Blasdel **Klaus Obermayer**	**865**	Putative Strategies of Scene Segmentation in Monkey Visual Cortex
Stephen Grossberg **Steven J. Olson**	**883**	Rules for the Cortical Map of Ocular Dominance and Orientation Columns
Robert K. Cunningham **Allen M. Waxman**	**895**	Diffusion-Enhancement Bilayer: Realizing Long-Range Apparent Motion and Spatiotemporal Grouping in a Neural Architecture
Stephen R. Jackson **Richard Marrocco** **Michael I. Posner**	**925**	Networks of Anatomical Areas Controlling Visuospatial Attention
Mike W. Oram **David I. Perrett**	**945**	Modeling Visual Recognition From Neurobiological Constraints
Samuel Kaski **Teuvo Kohonen**	**973**	Winner-Take-All Networks for Physiological Models of Competitive Learning
Bart L. M. Happel **Jacob M. J. Murre**	**985**	Design and Evolution of Modular Neural Network Architectures
Daniel L. Alkon **Kim T. Blackwell** **Garth S. Barbour** **Susan A. Werness** **Thomas P. Vogl**	**1005**	Biological Plausibility of Synaptic Associative Memory Models
Wolfgang K. Konen **Thomas Maurer** **Christoph von der Malsburg**	**1019**	A Fast Dynamic Link Matching Algorithm for Invariant Pattern Recognition
Theodore W. Berger **Gilbert Chauvet** **Robert J. Sclabassi**	**1031**	A Biologically Based Model of Functional Properties of the Hippocampus
Neil Burgess **Michael Recce** **John O'Keefe**	**1065**	A Model of Hippocampal Function

Ivan A. Bachelder **Allen M. Waxman**	**1083**	Mobile Robot Visual Mapping and Localization: A View-Based Neurocomputational Architecture That Emulates Hippocampal Place Learning
Daniel Bullock **John C. Fiala** **Stephen Grossberg**	**1101**	A Neural Model of Timed Response Learning in the Cerebellum
Kuniharu Arai **Edward L. Keller** **Jay A. Edelman**	**1115**	Two-Dimensional Neural Network Model of the Primate Saccadic System
Jim-Shih Liaw **Ananda Weerasuriya** **Michael A. Arbib**	**1137**	Snapping: A Paradigm for Modeling Coordination of Motor Synergies
Paul C. Bressloff **John G. Taylor**	**1153**	Dynamics of Compartmental Model Neurons
Raju S. Bapi **Daniel S. Levine**	**1167**	Modeling the Role of Frontal Lobes in Sequential Task Performance. I. Basic Structure and Primacy Effects
John G. Taylor	**1181**	Goals, Drives, and Consciousness

Volume 7, Number 8 1994

CONTENTS

Neural Networks Letters

Benedikt K. Humpert	**1191**	Improving Back Propagation With a New Error Function

Contributed Articles

Psychology and Cognitive Science

Hideki Hayakawa **Shin'ya Nishida** **Yasuhiro Wada** **Mitsuo Kawato**	**1193**	A Computational Model for Shape Estimation by Integration of Shading and Edge Information

Mathematical and Computational Analysis

Naonori Ueda **Ryohei Nakano**	**1211**	A New Competitive Learning Approach Based on an Equidistortion Principle for Designing Optimal Vector Quantizers
Stefan Jockusch **Helge Ritter**	**1229**	Self-Organizing Maps: Local Competition and Evolutionary Optimization
Kunikazu Kobayashi **Toyoshi Torioka** **Nobuhiko Ikeda**	**1241**	Fundamental Consideration on Self-Formation of Recognition Cells
Norio Baba **Yoshio Mogami** **Motokazu Kohzaki** **Yasuhiro Shiraishi** **Yutaka Yoshida**	**1253**	A Hybrid Algorithm for Finding the Global Minimum of Error Function of Neural Networks and Its Applications

Engineering and Design

Kenji Araki **Toshimichi Saito**	**1267**	An Associative Memory Including Time-Variant Self-Feedback

Ronald R. Yager	**1273**	Modeling and Formulating Fuzzy Knowledge Bases Using Neural Networks
Burkhard Lenze	**1285**	How to Make Sigma-Pi Neural Networks Perform Perfectly on Regular Training Sets
Alexander Shustorovich	**1295**	A Subspace Projection Approach to Feature Extraction: The Two-Dimensional Gabor Transform for Character Recognition
		Technology and Applications
Hiroshi Ohno **Toshihiko Suzuki** **Keiji Aoki** **Arata Takahasi** **Gunji Sugimoto**	**1303**	Neural Network Control for Automatic Braking Control System
T. Wagner **F. G. Boebel**	**1313**	Testing Synergetic Algorithms With Industrial Classification Problems
		Errata
J. G. Taylor **S. Coombes**	**1323**	Learning Higher Order Correlations
		Book Reviews
Paolo Gaudiano **David B. Rosen**	**1325**	*Introduction to the Theory of Neural Computation* by John Hertz, Anders Krogh, and Richard G. Palmer
Sriram Govindarajan **Vincent Brown**	**1329**	*The Computational Brain* by Patricia S. Churchland and Terrence J. Sejnowski
	1333	***Current Events***
	I	INNS/ENNS/JNNS Membership Renewal Form

Volume 7, Number 9 1994

CONTENTS

		Invited Article
Thomas P. Caudell **Scott D. G. Smith** **Richard Escobedo** **Michael Anderson**	**1339**	NIRS: Large Scale ART-1 Neural Architectures for Engineering Design Retrieval
		Contributed Articles
		Psychology and Cognitive Science
Brendan L. Rogers	**1351**	New Neural Multiprocess Memory Model for Adaptively Regulating Associative Learning Mathematical and Computational Analysis
Tao Wang	**1379**	Improving Recall in Associative Memories by Dynamic Threshold
Anne-Johan Annema **Klaas Hoen** **Hans Wallinga**	**1387**	Learning Behavior and Temporary Minima of Two-Layer Neural Networks
Roberto Brunelli	**1405**	Training Neural Nets Through Stochastic Minimization
Bill G. Horne **Don R. Hush**	**1413**	On the Node Complexity of Neural Networks

Patrick Thiran **Martin Hasler**	**1427**	Self-Organization of a One-Dimensional Kohonen Network With Quantized Weights and Inputs Engineering and Design
Bernd Fritzke	**1441**	Growing Cell Structures—A Self-Organizing Network for Unsupervised and Supervised Learning
Bernard Ans **Yves Coiton** **Jean-Claude Gilhodes** **Jean-Luc Velay**	**1461**	A Neural Network Model for Temporal Sequence Learning and Motor Programming
Yan Qiu Chen **David W. Thomas** **Mark S. Nixon**	**1477**	Generating–Shrinking Algorithm for Learning Arbitrary Classification
		Errata
K. Judd **K. Aihara**	**1491**	Pulse Propagation Networks: A Neural Network Model That Uses Temporal Coding by Action Potentials
	1493	***Current Events***
	I	Volume 7, 1994 Content and Author Indexes
	XVI	INNS/ENNS/JNNS Membership Renewal Form

Author Index
Volume 7, 1994

Abdel-Magid, Y., 183
Aihara, K., 848, 1491
Alkon, D. L., 1005
Amirikian, B., 321
Anderson, M., 1339
Annema, A.-J., 1387
Ans, B., 1461
Aoki, K., 1303
Arad, N., 441
Arai, K., 1115
Araki, K., 1267
Arbib, M. A., 1137
Azmy, N., 589

Baba, N., 1253
Bachelder, I. A., 1083
Bachmann, C. M., 709
Backwell, K. T., 1005
Bahrami, M., 409
Bapi, R. S., 1167
Barbour, G. S., 1005
Bartlett, E. B., 129
Battiti, R., 691
Batur, C., 661
Baxter, D. A., 406
Beaufays, F., 183
Berger, T. W., 1031
Bersini, H., 767
Blasdel, G., 865
Boebel, F. G., 1313
Bressloff, P. C., 1153
Brown, V., 1329
Brunelli, R., 1405
Bullock, D., 1101
Buonomano, D. V., 406
Burgess, N., 1065
Burke, L. I., 681
Byrne, J. H., 406

Cachin, C., 175
Carpenter, G. A., 159
Caudell, T. P., 1339
Cavalieri, S., 397
Chakraborty, K., 203
Chauvet, G., 1031
Chen, Y. Q., 1477
Chin, D. C., 573
Chover, J., 233
Christodoulou, M. A., 293
Chung, F. L., 539
Clarkson, T. G., 523
Coiton, Y., 1461
Colla, A. M., 691
Conrad, M., 341
Coombes, S., 1323
Coultrip, R. L., 463
Courrieu, P., 169
Cunningham, R. K., 895

De Moor, B. L. R., 819
DeLaurentis, J. M., 141
Deng, L., 331
Di Massimo, C., 283
Di Stefano, A., 397
Dickey, F. M., 141

Eckmiller, R., 271
Edelman, J. A., 1115
Elmasry, M., 331
Escobedo, R., 1339
Esposito, A., 195

Fahner, G., 271
Fiala, J. C., 851, 1101
Francis, G., 375
Fritzke, B., 1441
Fukumura, N., 553
Fukushima, K., 41, 206

Gallant, A. R., 147
Gaudiano, P., 213, 405, 1325
Georgiopoulos, M., 495
Gilhodes, J.-C., 1461
Gorse, D., 523
Govindarajan, S., 1329
Granger, R. H., 463
Greene, P. H., 575
Grossberg, S., 205, 863, 883, 1101
Guan, Y., 523
Guenther, F. H., 851

Hagiwara, K., 411
Happel, B. L. M., 985
Hasler, M., 1427
Hassanein, K., 331
Hasselmo, M. E., 13
Hayakawa, H., 1193
Hayashi, Y., 219
Heileman, G. L., 495
Hertz, D. B., 203
Hestenes, D., 65, 79
Hiroshige, K., 41
Hirsch, M. W., 449
Hoen, K., 1387
Horne, B. G., 1413
Hu, Q., 203
Huang, J., 495
Humpert, B. K., 1191
Hush, D. R., 1413

Ikeda, N., 1241

Jackson, S., 925
Jaskolski, J., 671
Jia, Q., 411
Jockusch, S., 1229
Joutsensalo, J., 113
Judd, K. T., 848, 1491

Karhunen, J., 113
Kaski, S., 973
Kasparian, V., 661
Katsuura, H., 455
Kawamoto, M., 753
Kawato, M., 1193
Keller, E. L., 1115
Kil, R. M., 643
Klemmer, N., 261
Kobayashi, K., 1241
Koehler, G. J., 301
Kohonen, T., 973
Kohzaki, M., 1253
Konen, W. K., 1019
Kosmatopoulos, E. B., 293
Kosowsky, J. J., 477
Kosugi, Y., 389
Krishnamurthy, E. V., 847
Krzyzak, A., 609

Lee, S., 643
Lee, T., 539
Lemmon, M., 101
Lenze, B., 1285
Levine, D. S., 1167
Liaw, J.-S., 1137
Luong, D., 709

Manry, M. T., 209
Marrocco, R., 925
Martinetz, T., 507
Martinez, T., 491
Matsugu, M., 419
Matsuoka, K., 753
Maurer, T., 1019
McCaffrey, D. F., 147
Mehrotra, K., 203
Michel, A. N., 251
Minai, A. A., 783
Mirabella, O., 397
Mitiche, A., 313
Mitra, S., 353
Mogami, Y., 1253
Mohan, C., 203
Morris, A. J., 283
Mukhopadhyay, S., 737
Murre, J. M. J., 985
Musman, S. A., 709

Nabhan, T. M., 89
Nakano, R., 1211
Narendra, K. S., 737
Nishida, S., 1193
Nishimura, H., 321
Nixon, M. S., 1477

O'Keefe, J., 1065
Obermayer, K., 865
Ochiai, K., 797
Ohno, H., 1303
Okada, M., 41
Olson, S. J., 883
Oram, M. W., 945

Padovan, J., 661
Pakdaman, K., 589
Pal, S. K., 353
Pandya, A. S., 833
Perlovsky, L. I., 565, 671
Perrett, D. I., 945
Posner, M. I., 925

Rampone, S., 195
Ranka, S., 203
Raymond, J. L., 406
Recce, M., 1065
Refenes, A. N., 375
Ritter, H., 1229
Rogers, B. L., 1351
Rogova, G., 777
Rosen, D. B., 1325

Saerens, M., 767
Saito, T., 1267
Schiffmann, W. H., 409
Schulten, K., 507
Schultz, A., 709
Schwartz, E. L., 441
Sclabassi, R. J., 1031
Shimizu, H., 49
Shiraishi, Y., 1253
Shustorovich, A., 1295
Smalz, R., 341
Smith, S. D. G., 1339
Softky, W. R., 853
Sotelino, L. G., 767
Sprecher, D. A., 455
Sudhakar, R., 833
Sugimoto, G., 1303
Surmeli, D., 405
Suykens, J. A. K., 819
Suzuki, T., 1303
Szu, H. H., 809

Tagliaferri, R., 195
Takahasi, A., 1303
Takeuchi, J., 389
Tang, Z., 301
Tani, J., 553
Taylor, J. G., 523, 863, 1153, 1181, 1323
Telfer, B. A., 809
Tham, M. T., 283
Thiran, P., 1427
Thomas, D. S., 313
Thomas, D. W., 1477
Toda, N., 411, 797
Torioka, T., 1241

Ueda, M., 1211
Usui, S., 411, 797

van der Smagt, P., 1
van Hemmen, J. L., 261
Van Horn, K. S., 491
Vandewalle, J., 819
Velay, J.-L., 1461
Venugopal, K. P., 833
Vibert, J.-F., 589
Vogl, T. P., 1005
von der Malsburg, C., 1019

Wada, Y., 1193
Wagner, T., 1313
Wallinga, H., 1387
Wang, J., 629
Wang, K., 251
Wang, T., 1379
Wang, Z., 283
Waxman, A. M., 895, 1083
Weerasuriya, A., 1137
Werness, S. A., 1005
Widrow, B., 183
Williams, R. D., 783
Wilson, F. D. M., 405
Wimbauer S., 261
Wollberg, Z., 441

Xu, L., 609

Yager, R. R., 1273
Yamaguchi, Y., 49
Yeshurun, Y., 441
Yoshida, Y., 1253
Yuille, A. L., 419, 477, 609

Zapranis, A., 375
Zhang, H., 661
Zomaya, A. Y., 89